

WHAT IS CLAIMED IS:

1. A system for integrating biological instruments that acquire data from biological samples with analysis applications that analyze the data acquired from the biological samples, the system comprising:

a registry containing protocol information for each of the biological instruments and the analysis applications; and

an applications manager that communicates with both the analysis applications and the biological instruments wherein the applications manager has access to the registry and upon receiving instructions to have a biological instrument acquire data from selected biological samples and provide the sample data to selected analysis applications, the applications manager retrieves the protocol information from the registry and directs parameters to be configured for the biological instrument such that the data captured by the biological instrument is made available to the analysis application in a suitable format.

2. The system of Claim 1, further comprising a messaging service associated with the applications manager that provides messages to the selected analysis applications when the biological instrument has captured the data to thereby induce the analysis application to acquire the sample data for subsequent analysis.

3. The system of Claim 2, wherein the messaging service is a broadcast message service that broadcasts signals to each of the analysis applications which are recognized and processed by the selected analysis applications to thereby initiate sample analysis using the acquired data.

4. The system of Claim 1, wherein the protocols contained within the registry include format protocols for each analysis application defining the format of the data that the analysis application is to receive.

5. The system of Claim 4, wherein the protocols further include parameters defining: the colors supported by the analysis application, sample types

compatible with the analysis application, size standard files compatible with the analysis application, and analysis protocols for the analysis application.

6. The system of Claim 1, further comprising a user interface associated with the applications manager that allows a user to perform functions including: viewing or defining status of the system, viewing or defining status of individual instruments, viewing or defining status of individual analysis applications, viewing or defining run completion times, viewing or defining instrument operation queues, viewing or defining application operation queues, and viewing or defining users associated with selected process runs.

7. The system of Claim 1, further comprising a user interface associated with the applications manager that allows a user to define a sample run comprising a series of operations to be performed in connection with one or more samples; the operations further comprising instrument operations and analysis application operations.

8. The system of Claim 1, further comprising a database having stored therein records of the location of samples available for analysis by the system.

9. The system of Claim 1, wherein additional analysis applications and instruments can be incorporated into the system by registering an associated protocol within the registry and configuring a suitable plug-in to facilitate communication between the applications manager and the analysis application or instrument to be incorporated into the system.

10. The system of Claim 1, wherein each instrument is associated with a plug-in suitable for capturing data generated by the instrument and forwarding the data to other components within the system.

11. The system of Claim 10, wherein the plug-in components and the analysis manager comprise software based daemons.

12. A system for integrating a plurality of biological data acquisition instruments that obtain data from samples with a plurality of data analysis applications, the system comprising:

a plurality of instrument components respectively associated with the biological data acquisition instruments;

at least one registry containing instrument protocols for each of the plurality of instrument components and protocols for each of the data analysis applications; and

an applications manager that communicates with the plurality of instrument components and the plurality of data analysis applications, wherein the applications manager has access to the at least one registry and includes an associated user interface such that a user can program a series of operations associated with a biological analysis by selecting the samples to be analyzed, selecting the instruments from the registry to process and capture the data from the samples, and selecting the analysis applications from the registry to receive and process the data; wherein additional instruments and additional analysis applications can be added to the system by registering the additional instrument component protocols and the additional analysis application protocols in the registry.

13. The system of Claim 12, further comprising a messaging service associated with the applications manager such that the applications manager can provide messages to the analysis application when the instrument has acquired the data to thereby notify the analysis application of the availability of the data for subsequent processing.

14. The system of Claim 13, wherein the messaging service is a broadcast message service that broadcasts signals to each of the analysis applications which are recognized and processed by a suitable analysis application to thereby initiate sample analysis using the acquired data.

15. The system of Claim 12, wherein the protocols contained within the registry include format protocols for the analysis applications defining the format of the data that each analysis application is to receive.

16. The system of Claim 15, wherein the protocols further include parameters defining the colors supported by the analysis applications, sample types

compatible with the analysis applications, size standard files compatible with the analysis applications, and analysis protocols for the analysis applications.

17. The system of Claim 12, further comprising a database having records of the location of samples available for analysis by the system that the user can access via the user interface and the applications manager can access to configure a biological process run.

18. The system of Claim 12, wherein additional analysis applications and instruments can be incorporated into the system by registering an associated protocol within the registry and configuring a suitable plug-in adapted to operate with the analysis applications or instruments to facilitate communication between the applications manager and the analysis applications or instruments.

19. The system of Claim 12, wherein each instrument is associated with a plug-in suitable for capturing data generated by a selected instrument and forwarding the data to other components within the system.

20. The system of Claim 19, wherein the plug-in components and the analysis manager comprise software based daemons.

21. A system for integrating a plurality of biological data instruments that obtain data from samples with a plurality of discrete data analysis applications, the system comprising:

- a plurality of instrument components respectively associated with the biological data instruments;

- at least one registry containing instrument protocols for each of the plurality of instrument components and data protocols for each of the data analysis applications wherein the protocols include a messaging protocol;

- a data structure containing information describing a plurality of biological samples; and

- an applications manager that communicates with the plurality of instrument components and the plurality of data analysis applications via a standardized communications protocol, wherein the applications manager has access to the at least one registry and the data structure and includes an

associated user interface such that a user can program a series of operations for performing a biological analysis via the user interface such that particular biological samples are processed by selected instruments and upon completion of the processing of samples the data can be made available to the data analysis application for analysis, and wherein the applications manager automatically makes the data available to the data analysis application by sending a standardized communications signal to the data analysis application protocol indicative of the location of the data.

22. The system of Claim 21, wherein the applications manager broadcasts messages to each analysis application which are recognized and processed by a selected analysis applications to thereby initiate sample analysis using the acquired data.

23. The system of Claim 21, wherein the protocols contained within the registry include format protocols for each analysis application defining the format of the data that the analysis application is to receive.

24. The system of Claim 23, wherein the protocols further include parameters defining: die colors supported by the analysis application, sample types compatible with the analysis application, size standard files compatible with the analysis application, and analysis protocols for the analysis application.

25. The system of Claim 21, further comprising a user interface associated with the applications manager that allows a user to develop a sample run for one or more selected samples.

26. The system of Claim 25, further comprising a plate database having records of each plate of biological samples available for analysis by the system.

27. The system of Claim 21, wherein additional analysis applications and instruments can be added to the system by registering an appropriate associated protocol in the registry and an associated plug-in with the applications manager.

28. The system of Claim 27, wherein the plug-in comprises a data capture component associated with a particular instrument.

29. The system of Claim 28, wherein the plug-in and the analysis manager comprise software-based daemons.

30. A system for integrating a plurality of biological data instruments that obtain electronic data from physical data samples with a plurality of discrete electronic data analysis applications, the system comprising:

- a plurality of instrument components respectively associated with the biological data instruments;

- at least one registry containing instrument protocols for each of the plurality of instrument components and the protocols for each of the electronic data analysis applications;

- a plate data structure containing information indicative of a plurality of biological samples; and

- an applications manager that communicates with the plurality of instrument components and plurality of discrete electronic data analysis applications, wherein the applications manager has access to the at least one registry and the plate data structure and includes an associated user interface such that a user can program a series of biological analyses by selecting the samples from the plate data structure, selecting the instrument from the registry to capture the electronic data from the physical data samples, and selecting the analysis applications from the registry to receive the electronic data, wherein additional instruments and additional analysis applications can be added to the system by registering the additional instrument component protocols and the additional analysis application protocols within the registry.

31. A system for integrating a plurality of biological data instruments that obtain electronic data from physical data samples with a plurality of discrete electronic data analysis applications, the system comprising:

- a plurality of instrument components respectively associated with the biological data instruments;

at least one registry containing instrument protocols for each of the plurality of instrument components and the protocols for each of the electronic data analysis applications wherein each protocol includes a messaging protocol;

a plate data structure containing information indicative of a plurality of biological samples; and

an applications manager that communicates with the plurality of instrument components and plurality of discrete electronic data analysis applications via a standardized communications protocol, wherein the applications manager has access to the at least one registry and the plate data structure and includes an associated user interface such that a user can program a series of biological analysis via the user interface such that particular biological samples are processed by particular instruments and upon completion of the processing of particular biological samples the electronic data is made available to the data analysis application for electronic analysis, wherein the applications manager automatically makes the data available to the data analysis application by sending a standard communications signal to the data analysis application protocol indicative of the location of the biological data.